February 7, 2022

U.S. Department of Transportation
Docket Operations
West Building Ground Floor, Room W12-140,
1200 New Jersey Ave., SE,
Washington, DC 20590

Re: Petition for Exemption from the Federal Aviation Regulations 14 CFR §§ 107.36; 137.19(c) and (d); 137.19(e)(2)(ii), (iii), and (v); 137.31(a) and (b); 137.33(a) and (b); 137.41(c), and 137.42.

To Whom it May Concern,

EMBRY-RIDDLE AERONAUTICAL UNIVERSITY, INC. (ERAU) petitions for an exemption from the mentioned Federal Aviation Regulations (FAR's) to conduct agricultural aircraft operations as defined in 14 CFR § 137.3. Under the procedures stipulated in 14 CFR Part 11, this petition for exemption is a request to the Federal Aviation Authority (FAA) by ERAU asking for relief from requirements of a current regulation.

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I. QUICK REFERENCE SUMMARY

- The operations described will be conducted under 14 CFR Part 107 using an agricultural aircraft for agricultural purposes.
- Aircraft Details:

  Make: DJI

  Model: AGRAS

  Series: MG-1P (<55.0 lbs)
- Supporting documents included with the petition

  Training Manual

  Flight Operations Manual

  Aircraft Manufacturer Manual

II. PETITIONERS ADDRESS

- Mailing Address:

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  1 AEROSPACE BLVD.

  WORLDWIDE COLLEGE OF AERONAUTICS

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III. SECTIONS FROM WHICH THE PETITIONER SEEKS EXEMPTION

The petitioner seeks exemptions from the below sections, each of these sections will be discussed in further detail further into the petition.

- 14 CFR § 107.36
- 14 CFR § 137.19(c) and (d)
- 14 CFR § 137.19(e)(2)(ii), (iii), and (v)
- 14 CFR § 137.31
- 14 CFR § 137.33
- 14 CFR § 137.41(c)
- 14 CFR § 137.42

IV. EXTENT FOR RELIEF

The petitioner proposes the limitations and conditions below as providing an equivalent level of safety as currently imposed by FAR's.

1. Operations authorized through this exemption will be limited to any model small unmanned aircraft systems (small UAS) as defined in 14 CFR § 107.3, whose weight at take-off does not exceed 55 pounds.
2. The operator will notify the Flight Standards District Office (FSDO) of new small UAS models operated under this exemption. Furthermore, operations authorized under this exemption will be limited to small UAS listed on the operator's Part 137 Letter of Authorization (LOA).
3. Small UAS authorized to be used under this exemption that has undergone maintenance or flight altering changes, must undergo an initial flight test and verification post maintenance or change, and prior to being used under this exemption. Such a test shall be strictly conducted by a remote pilot in command (PIC), a visual observer (VO), and associated persons of interest (such as technicians or engineers). The test should not pose undue hazard to persons or property.
4. The operator must follow maintenance, repair, and overhaul (MRO) schedules as stipulated in operating documents. Furthermore, small UAS flight hours must be tracked in accordance with recommended manufacturer life-limit requirements. All small UAS operated and conducted under this exemption must follow manufacturer safety operation guidelines.
5. The remote pilot in command (PIC) as defined in 14 CFR § 107.19 must ensure that the small UAS operation complies with all applicable regulations outlined in 14 CFR Part 107. Furthermore, the remote PIC must demonstrate the ability to safely operate a small UAS in a manner consistent with the activities conducted within this exemption, including the knowledge and skill requirements outlined in 14 CFR Part 137 for agricultural aircraft operations.
6. The remote PIC must recover or land (instant land) the aircraft immediately upon loss of Global Navigation Satellite System (GNSS) for operations where GNSS is essential to conduct the small unmanned aircraft. Furthermore, the remote PIC must set a pre-determined failsafe flightpath (return-to-home) that ensures the small unmanned aircraft returns to its designated land-zone immediately upon command. In addition, the remote PIC must abort the flight using either instant land or return-to-home if the remote PIC loses radio connection to the aircraft, an unpredicted emergency circumstance arises, or an undetermined potential hazard to persons or property is identified. Aborting flight must be done without undue hazard to persons or property in the air or surface.

7. This exemption and all associated documents needed to operate and conduct small UAS – within the conditions and limitations stipulated in this grant of exemption – are referred to as operating documents. In accordance with this exemption, §§ 107.13, and 137.33, operating documents include but are not limited to:
    - Operator exemption
    - Any waiver held
    - A facsimile of the agricultural aircraft operator certificate
    - Training manual
    - Operations manual
    - Aircraft registration certificate

    Operating documents are to be always available and easily accessible to Administrators when conducting small UAS operations. In case of a discrepancy between Conditions and Limitations stipulated in this exemption including FAA issued waivers and authorizations, and procedures outlined in the operating documents, the greatest restrictive condition, limitation, provision, or procedure will be followed. In case of an update or revision of operating documents, or any update or revision would affect the basis upon which the FAA granted the exemption, then the operator must petition for an amendment to the exemption.
8. The relief granted from 14 CFR § 107.36 is limited to the use of economic poison as defined in 14 CFR § 137.3.
9. The remote PIC may operate the small UAS from a moving land or water-borne vehicle as defined in 14 CFR § 107.25 if the aircraft is flown over a sparsely populated area. However, the remote PIC must demonstrate applicable knowledge and skills per § 137.19 in the type of agricultural device or vehicle to be used for flight operations.
10. This exemption shall not be valid for operations outside the United States of America.

V. REASONS AND EQUIVALENT LEVEL OF SAFETY FOR RELIEF

A. 14 CFR § 107.36 Carriage of hazardous material.

§ 107.36: "A small unmanned aircraft may not carry hazardous material. For purposes of this section, the term hazardous material is defined in 49 CFR 171.8."

The petitioner seeks relief from § 107.36 on grounds that some chemicals which need to be dispensed from a small unmanned aircraft during agricultural operations may be classified as hazardous materials. The materials to be used within this exemption are defined as economic poison in 14 CFR § 137.3.

An equivalent level of safety can be achieved by requiring the petitioner to obtain an FAA agricultural aircraft operator certificate, only allow pilots in possession of remote pilot certificates to operate aircrafts flown under this exemption, to only allow petitioner to fly aircraft weighing less than 55 pounds at take-off (including the hazardous material), to follow restrictions placed on agricultural aircraft operator certificates.

B. 14 CFR §§ 137.19(c), 137.41(c) Pilot in command

§ 137.19(c): "Commercial operator - pilots. The applicant must have available the services of at least one person who holds a current U.S. commercial or airline transport pilot certificate and who is properly rated for the aircraft to be used. The applicant himself may be the person available."
§ 137.41(c): Includes a reference to § 137.19(c).

In terms of commanding unmanned aircraft systems, the requirement of holding a private or commercial pilot certificate is burdensome. As found in previously granted exemptions of similar magnitudes, an equivalent level of safety can be easily achieved through the sole requirement of a remote pilot certificate and agricultural operations certificate, and the requirement of following procedures and rules outlined within Part 107, Part 137, and this exemption.

C. 14 CFR § 137.19(d) Aircraft

§ 137.19(d): "The applicant must have at least one certificated and airworthy aircraft, equipped for agricultural operation."

Since small unmanned aircraft as defined in 14 CFR Part 107 do not have any certification requirements, the petitioner requests this exemption. Furthermore, the petitioner aims to reach an equivalent level of safety through following requirements contained in the unmanned aircrafts' operating documents for determining whether the unmanned aircraft is airworthy.

D. 14 CFR § 137.19(e)(2)(ii), (iii), and (v) Skills test

Sections 137.19 paragraphs (e)(2)(ii), (iii), and (v) are not compatible or applicable to agricultural aircraft operations using multi-rotor unmanned aircraft. Therefore, the relief should be granted to agricultural aircraft operations which utilize only multi-rotor small unmanned aircraft.

An equivalent level of safety may be obtained through the sole requirement of a remote pilot certificate and agricultural operations certificate, and the requirement of following procedures and rules outlined within Part 107, Part 137, and this exemption.

E. 14 CFR § 137.33 Carrying of certificate

Section 137.33 paragraph (a) requires the agricultural operator certificate be carried on the aircraft. Furthermore, paragraph (b) requires airworthiness certificates to be always available upon the request of an Administrator.

In terms of paragraph (a), we will be referencing an FAA legal opinion letter of Mark Bury to John Duncan on August 8, 2014, where the FAA general counsel's office responded to whether registration and airworthiness documents must be carried on-board unmanned aircraft. Mr. Bury responded by stating the following:

> "We find that the intent of these regulations is met if the pilot of the unmanned aircraft gas access to these documents at the control station from which he or she is operating the aircraft."

Similarly, the petitioner proposes to keep all certificates, registration, and operating documents on the ground and easily accessible to Administrators. This provides an equivalent level of safety as the regulations.

With respect to paragraph (b), because operations under 14 CFR Part 107 do not have any certification requirements, the petitioner requests this exemption because it would be extremely burdensome to acquire an airworthiness certificate in order to comply with the mentioned regulation. Furthermore, the petitioner aims to reach an equivalent level of safety through following requirements contained in the unmanned aircrafts' operating documents for determining whether the unmanned aircraft is airworthy.

F. 14 CFR § 137.41(c) Pilot in command

§ 137.41(c): "No person may act as pilot in command of an aircraft unless he holds a pilot certificate and rating prescribed by § 137.19 (b) or (c), as appropriate to the type of operation conducted. In addition, he must demonstrate to the holder of the Agricultural Aircraft Operator Certificate conducting the operation that he has met the knowledge and skill requirements of § 137.19(e). If the holder of that certificate has designated a person under § 137.19(e) to supervise his agricultural aircraft operations the demonstration must be made to the person so designated."

An exemption from this regulation is based upon the same reasons cited for §137.19(c) and §137.19(e)(2)(ii), (iii), and (v). An equivalent level of safety can be provided by the proposed restrictions listed in this exemption. Additionally, all the pilots in command are required to have passed training and safety assessments imposed by the petitioning entity along with obtaining remote pilot certificates and agricultural aircraft operator certificates.

G. 14 CFR § 137.42 Fastening of safety belts and shoulder harnesses

§ 137.42: "No person may operate an aircraft in operations required to be conducted under part 137 without a safety belt and shoulder harness properly secured about that person except that the shoulder harness need not be fastened if that person would be unable to perform required duties with the shoulder harness fastened."

The abovementioned regulation is intended to protect personnel on-board aircraft. Given the nonexistence of personnel on-board small unmanned aircraft systems, the safety factor is equally the same. Having said that, we would like an exemption from this regulation in-order to carry-out the requested agricultural operations.

VI. HOW GRANTING THIS REQUEST IS IN THE PUBLICS INTEREST

Enabling and facilitating the use of small unmanned aircraft for agricultural purposes through the acceptance of this exemption would result in numerous benefits to the public. First, using small electric unmanned aircraft as alternatives to manned combustion engine aircraft would lead to a smaller carbon footprint exerted into the environment, and subsequently would benefit public health. Furthermore, the use of the proposed multi-rotor small unmanned aircraft in this petition would allow for a greater factor of safety in delivering agricultural operations because:

1. The weight and velocity of the multi-rotor aircraft compared to a manned aircraft greatly reduces the kinetic energy involved in ground or obstacle impact. Additionally, the lack of combustible fuel yields an inherently safer operation.
2. The multi-rotor aircraft contains multiple rotors, hence being more redundant as compared to single rotor aircraft. As a result, multi-rotor aircraft hold a higher factor of safety during operation during agricultural operations.
3. Multi-rotor aircraft fly at relatively low altitudes when compared to manned operations for agriculture. Furthermore, multi-rotor aircraft can hover, and stop at any point. Thus, mitigating mid-air collisions, making them safer to operate, and less prone to error as compared to manned agricultural aircraft.

Using small unmanned aircraft for agricultural operations as compared to manned aircraft enables the end-user or client to opt for precision agriculture and spray benefits. In comparison, unmanned aircrafts use substantially less hazardous material to produce a desired yield when compared to the use of manned aircraft through the intense precision in unmanned agricultural processes.

VII. FEDERAL REGISTER SUMMARY

As required by 14 CFR Part 11, below is the summary of the petition to be published in the Federal Register should it be deemed that publishing is needed.

The petitioner seeks an exemption from the following regulations:

14 CFR §§ 107.36; 137.19(c) and (d); 137.19(e)(2)(ii), (iii), and (v); 137.31(a) and (b); 137.33(a) and (b); 137.41(c), and 137.42.

In order to successfully, and lawfully operate a small unmanned aircraft, weighing less than 55 pounds upon takeoff, commercially for agricultural aircraft operations as defined in 14 CFR § 137.3. This exemption is needed due to the immense burden current regulations impose on small unmanned aircrafts

while conducting agricultural operations. The proposed restrictions contained in the petition, operating documents, and manuals will provide an equivalent level of safety as the regulations.

VIII. STATUTORY AUTHORITY TO GRANT THIS PETITION

The Federal Aviation Act grants the FAA authority to provide exemptions from regulations within their lawful jurisdictions. "The Administrator may grant an exemption from a requirement of a regulation prescribed under subsection (a) or (b) of this section or any sections 44702-44716 of this title if the Administrator finds the exemption in the public interest."[3]

IX. CONCLUSION

The operation of EMBRY-RIDDLE AERONAUTICAL UNIVERSITY, INC. using small UAS, weighing less than 55 pounds, for the purpose of agricultural operations, conducted under the restrictions outlines above, will provide an equivalent level of safety as compared to the current burdensome regulations.

Sincerely yours,

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